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US 5505199 A ✓ US 4370675 A

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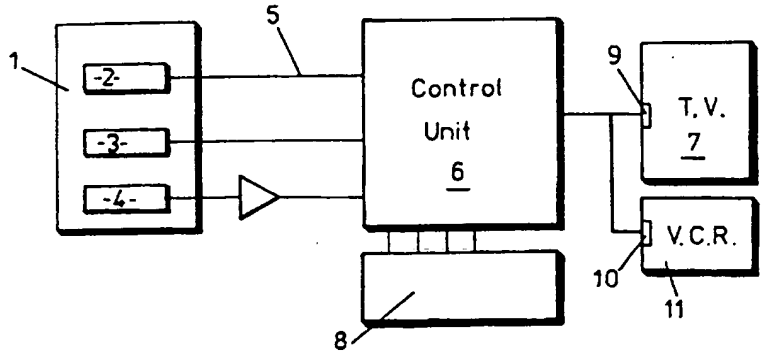
(54) Abstract Title
Baby monitoring apparatus

(57) Baby monitoring apparatus is provided comprising a control unit 6 for receiving video and audio signals from a remote monitoring unit 1 via a cable 5 and outputting them to a televison receiver 9 either directly or optionally via a video recorder 10 using SCART connections. The control unit has a preselected sound threshold such that when the audio signal received from a microphone 4 exceeds an audio threshold for a predetermined period of time the control unit interrupts broadcast reception on the television receiver with the video signal transmission from a camera 2. After a predetermined time period, the television receiver can return to the original broadcast. The control unit 6 is provided with a loudspeaker and a control panel 8 comprising means to adjust the loudspeaker volume and audio signal threshold. The control panel 8 may also provide an override switch to allow the user to view the received video signal at any time. A further switch may be provided to allow for continuous broadcast of the audio signal through the loudspeaker. The control unit 6 may be connected to a device that simulates the remote control of a television receiver to switch to the video signal. An infra red light source 3 can also be provided in the remote unit 1.



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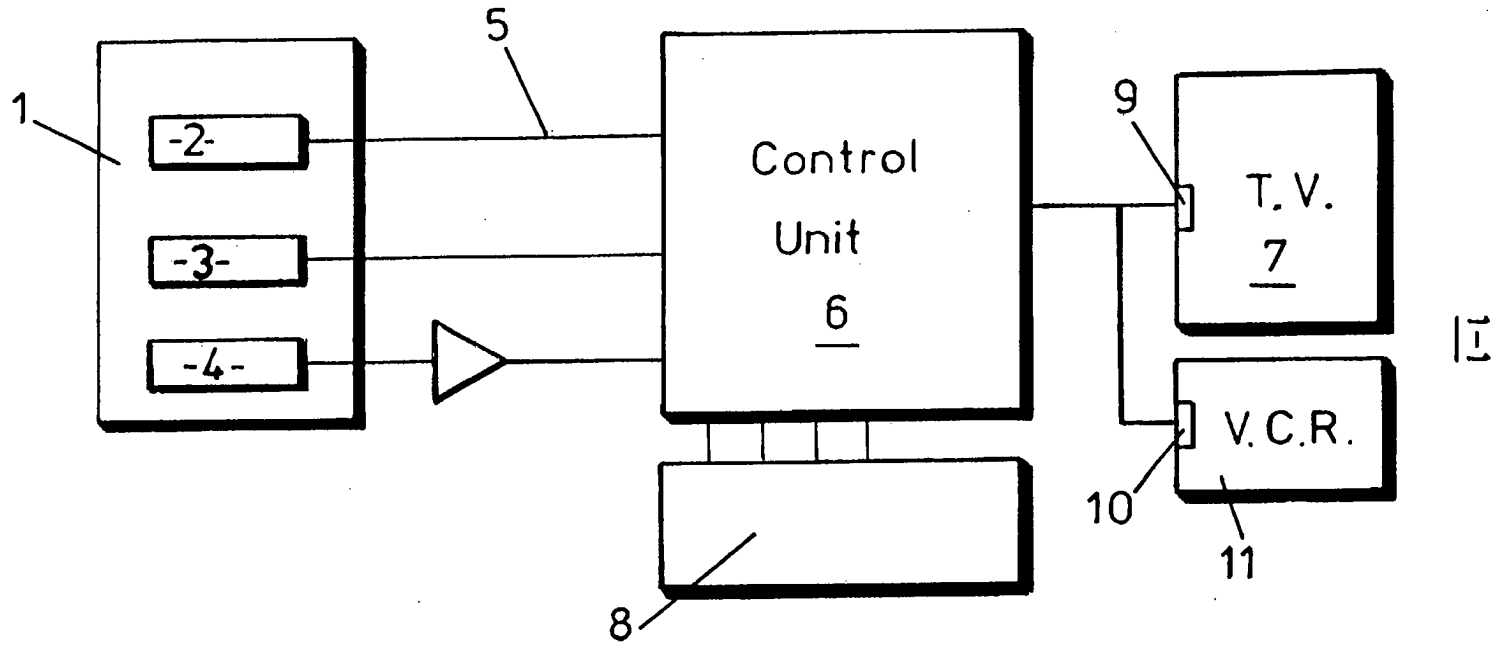
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995


1
-2-
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Control
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MONITORING APPARATUS

The present invention relates to monitoring apparatus particularly for monitoring infants or babies when in bed.

Remote loudspeakers for monitoring the sound of a baby or infant when in a cot are well known. Any sound made by the baby is picked up by a microphone and transmitted to a remote mobile loudspeaker that is kept within ear's reach of a parent or baby-sitter.

A problem with such existing devices is that the transmitted sound does not always convey sufficient information to the parent or baby-sitter. Moreover, the parent may become engrossed in, for example, a television programme and not be entirely receptive to the sound emitted from the loudspeaker.

It is an object of the present invention to obviate or mitigate the aforesaid disadvantages.

According to the present invention there is provided monitoring apparatus comprising a video camera for monitoring a baby or infant, a microphone for receiving sound made by the baby or infant, a remote television receiver for viewing a video signal output from the camera and a control unit having an input connected to the microphone for receiving an audio signal and an output that is connected to the television receiver, wherein the control unit has a pre-selected audio signal threshold level such that when the received audio signal exceeds said threshold the control unit interrupts broadcast reception on the television receiver with the video signal transmission from the video camera.

Preferably the control unit has means to adjust the pre-selected audio threshold level. The audio threshold level is preferably a volume level but may also include a audio signal duration level so that only audio signals above the volume level for a predetermined period of time cause the control unit to interrupt the broadcast reception.

The control unit preferably allows the television receiver to revert to the broadcast reception a predetermined period of time after the interruption.

The control unit preferably has an override switch that allows the user to switch to the received video signal at any time.

In a preferred embodiment the video camera output is also connected to a video cassette recorder associated with the television receiver so that the video signal may be recorded.

A specific embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawing which is a block diagram of the monitoring apparatus.

A monitoring unit 1, positioned in an appropriate place in the baby's or infant's bedroom, is an integral assembly comprising a video camera 2, an infra-red light source 3 and a microphone 4, all being of conventional design.

The output of the monitoring unit 1 is connected, via a multi-core cable 5, to the input of a control unit 6 that is conveniently placed near a main television receiver 7 in the home remote from the monitoring unit 1.

The control unit 6 is powered from the mains supply electricity of the home and has a control panel 8 operable by the user. An output of the control unit 6 is connected to a scart socket 9 of the television receiver 7 and, optionally, the scart socket 10 of an associated video cassette recorder (VCR) 11.

The control unit 6 incorporates an audio loudspeaker (not shown) for transmitting the audio signal to the user. The control panel 8 has a volume control button that allows the user to control an amplifier associated with the loudspeaker so that the volume of the audio signal output from the loudspeaker is acceptable.

The control panel 8 also has an audio threshold level adjustment control that enables the user to set the volume threshold of the control unit 6 so that they are only alerted to sounds made by the baby or infant that exceed a certain volume. The control unit 6 will then only pass on the received signals to the output when the threshold is exceeded for a predetermined period of time (so as to distinguish the signal from irrelevant or intermittent background noise).

In use, the video camera is trained on a baby or infant when it is sleeping in its cot or bed. The infra-red light source 3 allows the camera 2 to transmit pictures in the

dark (e.g. at night-time). Video signals from the camera 2 are transmitted to the control unit 6 as are audio signals from the microphone 4 (which may first be amplified by amplifier). The monitoring unit 1 is powered, typically, from a 12V DC signal that is carried along with all the output signals in the multi-core cable 5.

When the pre-selected volume threshold of the received audio signal is exceeded the control unit 6 transmits the video and audio signals to the television receiver 7 (via the scart socket 9) and loudspeaker respectively. At the same time as transmitting the video signal it applies a voltage to a particular pin of the scart socket 9 so that the picture displayed on the television receiver 7 will change from whatever channel is being viewed to the video signal received through the scart socket 9. Thus when a noise is detected that is above the volume threshold selected by the user, the television programme they are watching is interrupted and the picture viewed by the user changes to that seen by the video camera trained on the baby. In addition, the audio signal (previously muted) is broadcast by the loudspeaker. The control unit 6 allows the television receiver 7 to revert to the broadcast reception a predetermined period of time after the interruption. The noise may be that made by the baby or infant or may be from an extraneous source such as, for example, a slamming door, a clap of thunder etc.

The camera video signal may optionally be recorded by a VCR 11 if the output of the control unit 6 is connected to the VCR scart socket 10.

The user control panel 8 may include a function control switch that allows the user to change operation of the apparatus from that described above to continuous sound operation whereby the audio signal is continuously broadcast through the loudspeaker at a volume level selected by the user or, to an off condition in which the loudspeaker does not emit sound at any time. Additionally, the user control panel 8 has an override switch that allows the user to switch to the received video signal at any time.

The present invention provides for a relatively inexpensive audio and video monitoring system for monitoring a baby or infant after it has been put to bed without offering a continual distraction to the parent or baby-sitter.

It will be appreciated that numerous modifications to the above described design may be made without departing from the scope of the invention as defined in the appended claims. For example, the camera video signal be fed to the television receiver or VCR via connections other than the scart socket. One example is to introduce the video signal through an aerial socket of the television receiver or VCR using a modulator.

Moreover, the interruption of the broadcast may be achieved in different ways. For example, the programme channel may be changed automatically to a channel broadcasting the camera video signal by a device that simulates the infra-red remote control signal that is associated with most television receivers.

CLAIMS

1. Monitoring apparatus comprising a video camera for monitoring a baby or infant, a microphone for receiving sound made by the baby or infant, a television receiver for viewing a video signal output from the camera and a control unit having an input connected to the microphone for receiving an audio signal and an output that is connected to the television receiver, wherein the control unit has a pre-selected audio threshold level such that when the received audio signal exceeds said threshold the control unit interrupts broadcast reception on the television receiver with the video signal transmission from the video camera.

2. Monitoring apparatus according to claim 1, wherein the control unit has means to adjust the pre-selected audio threshold level.

3. Monitoring apparatus according to claim 2, wherein the audio threshold level is a volume level.

4. Monitoring apparatus according to claim 3, wherein the threshold level also includes an audio signal duration level so that only audio signals above the volume level for a predetermined period of time cause the control unit to interrupt the broadcast reception.

5. Monitoring apparatus according to any preceding claim, wherein the control unit allows the television receiver to revert to the broadcast reception a predetermined period of time after the interruption.

6. Monitoring apparatus according to any preceding claim, wherein the control unit has an override switch that allows the user to switch to the received video signal at any time.

7. Monitoring apparatus according to claim 6, wherein the video camera output is also connected to a video cassette recorder associated with the television receiver so that the video signal may be recorded.

8. Monitoring apparatus substantially as hereinbefore described with reference to the accompanying drawings.

The Patent Office

INVESTOR IN PEOPLE

Application No: GB 9818137.3 **Examiner:** Nigel Hanley
Claims searched: 1-8 **Date of search:** 14 February 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): H4F(FAAE,FAX)

Int Cl (Ed.7): G08B 13/16, 13/196, 13/20; H04M 11/08; H04N 7/18;

Other: ONLINE: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB 2312803 A	GILMARTIN - Whole Document	
A	EP 0935225 A2	LIVECAM - Whole Document	
A	US 5594498	FRALEY - Particularly Figure 1 and Column 10 line 23 to Column 11 line 18	
A	US 5505199	KIM - Figure 1	
A	US 4370675	COHN - Figure 1	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.